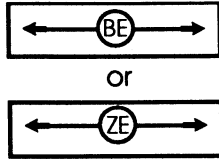


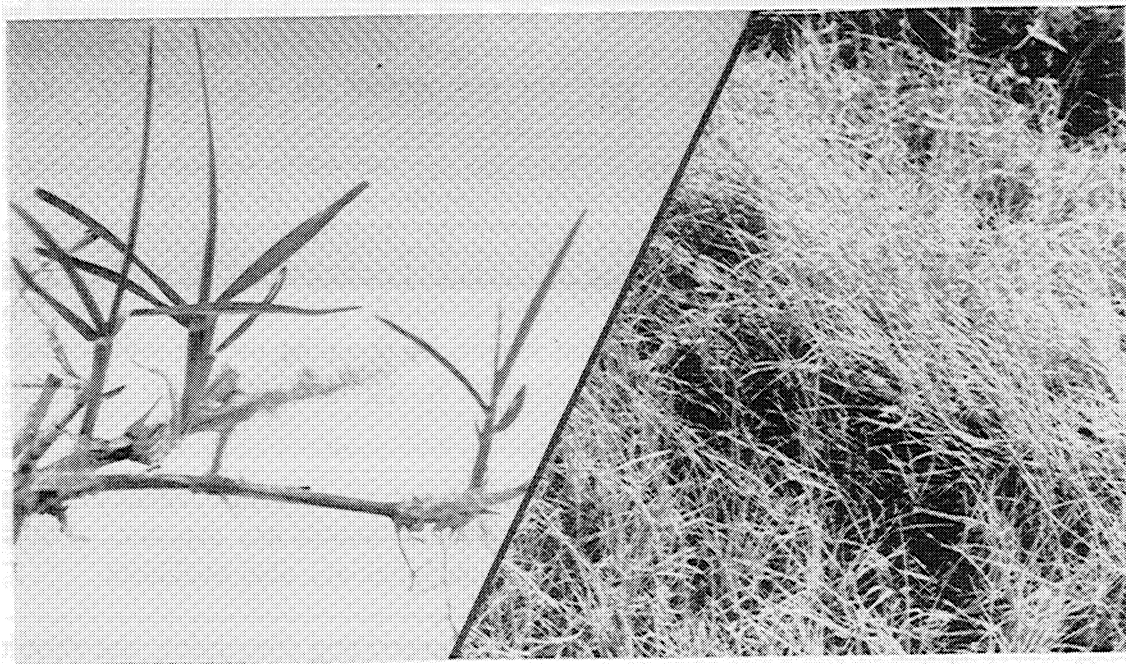
STD & SPEC 3.34

**BERMUDAGRASS &
ZOYSIAGRASS ESTABLISHMENT**Definition

The establishment of vegetative cover with hybrid Bermudagrass or Zoysiagrass by planting sprigs, stolons, or plugs.

Purposes

1. To reduce erosion and decrease sediment yield from disturbed areas.
2. To stabilize disturbed areas with a specific plant material suited to the site at a cost of less than would be incurred by installing sod.
3. To establish vegetative cover more rapidly than would be possible using seed.



Conditions Where Practice Applies

1. In areas where hybrid Bermudagrass or Zoysiagrass is the desired plant material, and establishment with sod is not preferred.
2. Bermudagrass and Zoysiagrass are particularly suited to droughty, sandy sites or situations where high salt content is a problem. They should not be used in shaded areas or on poorly drained sites.
3. Where irrigation can be made available during the establishment phase.

Planning Considerations

Bermuda and Zoysia are warm season, permanent grasses which are well-suited to erosion control, as they have vigorous rhizomes and stolons (runners). There are two types of Bermudagrass grown in Virginia, common and hybrid.

Common Bermudagrass produces seed and may be established with seed. However, it has the potential to become a weed problem because it spreads vigorously; it is also coarse and not suitable for fine turf. Common Bermuda has little cold tolerance and winterkills frequently.

Hybrid Bermudagrasses and Zoysiagrass are established mainly by sodding, sprigging, or plugging. There are recent developments in the turf industry that have allowed hybrid Bermuda stands to be established from seed; however, the technology is relatively new. These grasses produce a fine, tight turf, do not spread as vigorously as common Bermudagrass, exhibit good cold tolerance, and can withstand many adverse conditions. For these reasons, hybrid Bermudagrass and Zoysiagrass are the warm season permanent turf grasses of choice for Virginia.

Sprigging: A sprig is a small section of rhizome (underground stem) 3 to 5 inches long, with at least one node or joint. Leaves should be present at the nodes. Stolons (runners) are above-ground stems that spread by creeping on the soil surface. A mixture of sprigs and stolons is usually used in "sprigging". Sprigs may be planted by machine or hand.

Plugging: Plugs are small sections of sod which are pressed into precut holes in the soil so that topgrowth is flush to the surface and leaves are exposed. Plugs are usually planted by hand; however, plugging machines are also available.

Notably, where speed is essential and cost is not an overriding constraint, sod should be used (see SODDING, Std. & Spec. 3.33).

Both Zoysia and Bermuda are particularly suited to use in grasslined waterways. Depending upon the soil type, an established stand of can tolerate intermittent concentrated flows of

water on slopes up to 10%. It is important to divert runoff from the waterway during the first three weeks of establishment to permit the grass to take root. If this cannot be done, the center of the waterway should be sodded to prevent washout.

Bermudagrass is drought-tolerant, salt-tolerant, and tolerates floods of short duration. It prefers a pH range from 6.0-7.0 with high nitrogen fertilization during the growing season. Most Bermudagrasses are adapted to the warmer climates in Southeastern Virginia; however, turf research has developed several varieties that continue to perform very well in the western part of the state. Currently, varieties of all Bermudagrass will be dormant in winter and will turn brown at that time.

The Bermudagrass hybrids most frequently used in Virginia differ in appearance, cold tolerance, and suitability for turf use. The following varieties are suggested for rough and fine-turf areas:

For Rough Areas

Midland: A cold-hardy variety adapted in all areas of the state at medium to low elevations. Adapted for forage production, this is a tall-growing Bermuda (12-18 inches) and should be used in low-maintenance areas.

Coastal: Also a forage type, for low-maintenance areas. Can be used as far west and north as Chatham, Charlotte Courthouse, and Warsaw but will winterkill during severe winters at these locations.

For Fine-Turf Areas

Midiron: A fine-turf type. Has a good chance of surviving most winters as far west and north as Blacksburg and Charlottesville.

Vamont: Similar cold tolerance and texture to Midiron but far more aggressive.

Tufcote: A fine-turf type. Less cold-hardy than Midiron.

Tifway: A fine-textured turf type. Good survival east and south of Richmond in most years. Not as cold-hardy as Tufcote.

Research continues on the ways to successfully establish Zoysiagrass in Virginia. It has been determined that Zoysia has limited potential for use in athletic field development due to recovery problems and slow establishment. Establishment is commonly achieved by sprigs or plugs and seeds pre-treated with potassium hydroxide. The following varieties are presently listed on the VCI recommended list:

Meyer: A broad blade is prevalent. This variety is considered more winter-hardy than others.

Emerald: A fine-turf type. A much finer blade than that found on Meyer. This variety is also much less winter-hardy.

Specifications

Soil Preparation

Procedures for preparing the soil are the same for sprigging and plugging.

1. Bermuda and Zoysia require soil which is well drained, loose enough for root penetration, has a pH range between 6.0-7.0, and is free of toxic amounts of materials harmful to plant growth. If any of these criteria cannot be met, topsoil shall be applied in accordance with TOPSOILING, Std. & Spec. 1.61.
2. Necessary erosion and sediment control practices will be installed prior to establishment of Bermudagrass. Final grading will be carried out according to the approved plan.
3. Surfaces will be roughened in accordance with SURFACE ROUGHENING, Std. & Spec. 3.29.
4. The soil shall be free of debris, trash, large roots, and weeds.

Lime and Fertilizer

Soil tests should be made to determine the exact requirements for lime and fertilizer. Soil tests may be conducted by the State Laboratory at VPI&SU or a reputable commercial laboratory. Information on state soil tests is available from county or city agricultural extension agents.

Under difficult circumstances where it is not possible to obtain a soil test, the following soil amendments shall be made:

Pulverized agricultural limestone: 90 lbs./1,000 sq. ft.
(2 tons/acre). An agricultural grade of limestone should be used.

Fertilizer: Apply 1000 lbs. 10-10-10/acre and follow with additional nitrogen application as indicated by soil test conducted 30-60 days later.

Note: Equivalent nutrients may be applied with other fertilizer formulations.

These amendments shall be spread evenly over the area to be sprigged, and incorporated into the top 3-6 inches of the soil by disking, harrowing or other acceptable means.

Any irregularities in the soil surface resulting from topsoiling or other operations shall be filled or leveled in order to prevent the formation of water pockets.

Soil preparation, liming, and fertilizing should be completed before delivery of sprigs or sod is requested. This material is perishable and should not remain on a pallet or in crates longer than 36 hours from the time of digging. The presence of mildew or distinct yellowing of the leaves is usually a good indication of damage to turf.

Sprigging and Plugging

Sources

Sprigs can be purchased as sod and then shredded or can often be purchased by the bushel. For turf-type Bermudagrasses, Certified or Approved sod sources (bearing the label of the VCIA) should be used. Plugs may be cut from sod as needed or purchased pre-cut. Coastal and Midland Bermudagrasses may be available through agricultural sources. Interested persons should contact the county or city agricultural extension agent or the USDA-SCS district office for information on where these materials may be obtained. Sprigs shall be 3 to 5 inches long, having several nodes (joints). Plugs shall have a minimum diameter of 2 inches.

Quantities of Material Needed

Sprigging: 8-12 bushels/1,000 sq. ft. or 350-500 bushels/acre. One bushel of sprigs is approximately equal to 1 sq. yd. of sod (with soil removed).

Plugging: About 12 sq. yds. of sod for 1,000 sq. ft., or 530 sq. yds. of sod for one acre.

When to Plant

To establish quickly, many feel Bermudagrass should not be in a dormant state (leaves should be green). However there is research that shows some success with dormant installations. Nonetheless, in order that plants may develop adequate root structure before cold weather begins, plantings should be made no later than midsummer. May 1 through July 15 is the optimum season for Bermudagrass establishment. Some cultivars may be established as late as mid-August in the southeastern part of the state.

How to Plant

Sprigging: Sprigs may be broadcast over the surface by hand, planted in rows by machine, or applied with a hydrosprigger. Machines are available which will insert sprigs properly and firm the soil over them. When sprigs are broadcast or hydrosprigged, they should be partially covered with soil by light discing or topdressing with good soil. Ideally, half of the sprig should be covered with soil, and half (including some leaves) should be exposed. Soil should be firmed over the sprigs by using a cultipacker, or by rolling or tamping. When planted in rows, sprigs should be placed no more than 12 inches apart in rows which are 12 to 18 inches apart. Closer spacing is recommended for slopes, waterways, and highly erodible soils.

Plugging: Plugs should be inserted in the soil surface so that leaf tips are above the surrounding soil, and tamped firmly in place. Plugs should be placed in a grid pattern on 12- to 18-inch centers. Closer spacing is recommended on critical areas. Plugs are usually placed by hand, but machines are available which can plug automatically.

Helpful Hints

The following are essential for good Bermudagrass or Zoysiagrass growth:

1. Adequate moisture - water immediately after planting, and water enough to keep soil moist to a depth of 4 inches during the first 4 weeks and as needed thereafter to sustain growth.
2. Sunlight - do not permit mulches, other plantings, etc. to shade new Bermudagrass stands.
3. Freedom from erosive forces - keep concentrated flows of water off of new plantings for 2 weeks to one month.

Weed Control

In order to become effectively established, Bermudagrass must not have to compete with weeds for sunlight, water, or space. Cultivating is impractical as growing stolons may be injured.

Oxadiazon or equivalent, applied immediately following sprigging at a rate of 100-150 lbs./acre (depending on time of year), gives excellent control of most broadleaf and grassy weeds; use 2-3 lbs. of active ingredient/acre. For control of broadleaf weeds only, apply Dicamba (1/4 to 1/2 lb. active ingredient/acre) and 2,4-D (1 lb. active ingredient/acre). Use these herbicides when weeds are 2- to 3-inches tall, but not before grass is well-rooted.

Maintenance

Bermudagrass and Zoysiagrass sprigs and plugs can be expected to root in 5 to 10 days under optimum conditions. Full coverage of the soil by spreading plants can be obtained in 8-12 weeks with good growing conditions and proper maintenance.

Stands may be mowed when growth requires it. Coastal and Midland growths may be left unmowed except for once-a-year trimming to 6 inches. Turf-type Bermudagrasses may be cut at 1 to 1½ inches.

For maintenance purposes, apply 1 lb. actual nitrogen/1000 sq. ft. at 30-45 day intervals after initial installation until August 15th. Fertilizer must be of a type in which 50% or more of the nitrogen is water-insoluble.